

Evaluation of *Beta* PIs from the USDA-ARS NPGS for resistance to *Beet curly top virus*, 2003.

Thirty Plant Introductions (PIs) from the USDA-ARS National Plant Germplasm System (NPGS) (garden beet, sugar beet, leaf beet, fodder beet, and wild beet) were evaluated for resistance to the *Beet curly top virus* in an artificially inoculated nursery, managed by the Beet Sugar Development Foundation in Kimberly, ID. The field was planted on 9 through 10 Jun. Planting was late to maximize the number of viruliferous leafhoppers available to transfer to the sugar beets while they are in the 8- to 10-leaf stage. Plots consisted of two, 3.7 m long rows with 56 cm between-row spacing. Design was randomized complete block with two replications. After the beets emerged, rows were trimmed to a length of 2.4 m and thinned to an in-row spacing of 0.3 m, and cultivated. Viruliferous leafhoppers were released on 17 and 18 Jul to cause an artificial epiphytotic. One week before the leafhoppers were released in the nursery, they had been transferred onto curly top-infested beets to assure that they were viruliferous when placed in the field. Uniform infection was achieved by placing leafhoppers uniformly throughout the field at a rate of approximately 1.2 leafhoppers per plant and then spreading the leafhoppers four times daily for the next week by dragging a 3.7 m tarp across the field. The field was sprayed 11 Aug to kill the leafhoppers. Plots were visually evaluated and rated on a Disease Index (DI) scale of 0 to 9 (no symptoms to dead) on 21 Aug and 2 Sep. An analysis of variance (PROC GLM - SAS) on the disease indices (visual evaluation scores) determined that there were highly significant differences $P = 0.05$) among entries on both dates.

The summer was very hot and dry and the epiphytotic severe, thus ratings were taken earlier than last year (21 Aug, 2003 for first reading as opposed to 27 Aug, 2002). There were five accessions which were not significantly different from the resistant control at the first rating period, one of which was not significantly different at the second rating as well. We would like to express our appreciation to the Beet Sugar Development Foundation that funded this research trial and to Mr. Terry Brown of the BSDF, who managed the nursery and helped with the evaluations. These data, and more information on the accessions evaluated, are available through the USDA-ARS GRIN database at <http://www.ars-grin.gov/npgs>.

Entry	Identification	Donor's ID	Disease Index*	
			Aug 21	Sep 2
1	PI 504187	SD wild beet	5.8	7.8
2	PI 296539	Busczynshi P-poly	4.8	6.8
3	PI 504191	SD wild beet.....	4.5	5.5
4	PI 504203	SD wild beet.....	5.8	7.8
5	PI 504212	SD wild beet.....	5.8	7.5
6	PI 504215	SD wild beet.....	4.3	6.0
7	PI 504217	SD wild beet.....	4.5	7.0
8	PI 504218	SD wild beet.....	4.8	7.3
9	PI 504222	SD wild beet.....	4.8	8.8
10	PI 504224	SD wild beet.....	5.3	8.5
11	PI 504227	SD wild beet	5.8	8.0
12	PI 504229	SD wild beet.....	6.0	8.8
13	PI 504231	SD wild beet.....	5.8	9.0
14	PI 504232	SD wild beet.....	5.8	8.8
15	PI 504243	SD wild beet.....	5.8	8.8
16	PI 504244	SD wild beet.....	4.8	8.0
17	PI 504245	SD wild beet.....	5.5	8.3
18	PI 504246	SD wild beet.....	5.5	8.5
19	PI 504249	SD wild beet.....	5.5	6.3
20	PI 504252	SD wild beet.....	5.8	8.3
21	PI 504256	SD wild beet.....	4.6	7.0
22	PI 504276	SD wild beet.....	5.0	7.3
23	PI 504280	SD wild beet.....	5.3	7.8
24	PI 504281	SD wild beet.....	6.3	8.5
25	PI 504283	SD wild beet.....	6.3	6.5
26	PI 518317	SD IDBBNR 5811	5.3	7.5
27	PI 518336	SD IDBBNR 5830	5.0	6.5
28	PI 518344	SD IDBBNR 5838	5.3	7.3
29	PI 518357	SD IDBBNR 5851	4.8	6.8
30	Ames 19169	SD Mezotnenskaja Odnosemiannaga	4.0	6.0
31		Beta G6040 - Resistant Check	3.8	5.0
32		FC718 - Susceptible Check	4.8	7.3
LSD ($P=0.05$)			1.0	0.9

*Disease Index (DI) scale = 0 (no symptoms) to 9 (plant death).